



SEW
EURODRIVE



MOVITRAC® LTE-B **Communications Options**

Edition 04/2008

16643615 / EN

Operating Instructions



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Important Notes








Structure of the safety notes

1 Important Notes

1.1 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

Symbol	 SIGNAL WORD
	Nature and source of hazard. Possible consequence(s) if disregarded. • Measure(s) to avoid the hazard.

Symbol	Signal Word	Meaning	Consequences if disregarded
Example:  General hazard	 HAZARD	Imminent hazard	Severe or fatal injuries
 Specific hazard, e.g. electric shock	 WARNING	Possible hazardous situation	Severe or fatal injuries
	 CAUTION	Possible hazardous situation	Minor injuries
	STOP!	Possible damage to property	Damage to the drive system or its environment
	NOTE	Useful information or tip Simplifies drive system handling	

Unless the information in the operating instructions is adhered to, it will be impossible to ensure:

- Trouble-free operation
- Fulfillment of any rights to claim under guarantee

Consequently, read the operating instructions before you start working with the product!



1.2 Application environment

The following applications are forbidden unless measures are expressly taken to make them possible:

- Use in potentially explosive atmospheres
- Use in environments with harmful substances:
 - Oils
 - Acids
 - Gases
 - Vapors
 - Dust
 - Radiated interference
 - Other harmful environments
- Use subject to mechanical vibration and shock loads in excess of the requirements in EN 50178
- If the inverter performs safety functions which have to guarantee the protection of machinery and people

1.3 Waste disposal

Please dispose of the following parts in accordance with the current regulations:

- Electronics scrap (printed-circuit boards)
- Plastic (housing)
- Sheet metal
- Copper





2 Safety Notes

2.1 Installation and startup

- **Never install or start up damaged products.** In the event of damage please submit a complaint to the transport company immediately.
- **Installation, startup and service work** on the unit can only be carried out by **trained personnel**. The personnel must be trained in the relevant aspects of accident prevention and must comply with the regulations in force (e.g. EN 60204, VBG 4, DIN VDE 0100/0113/0160).
- Follow the **specific instructions** during **installation** and **startup**!
- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e.g. EN 60204 or EN 50178).
Grounding the unit is a necessary protective measure.
Overcurrent protection devices are a necessary protective measure.
- **The unit meets all requirements for reliable isolation** of power and electronics connections in accordance with UL508. **All connected circuits** must also **satisfy the requirements for reliable isolation** so as to guarantee reliable isolation.
- Take **suitable measures** to ensure that the connected **motor does not start up automatically when the inverter is switched on**. To do this, connect binary inputs DI01 through DI03 to GND.

2.2 Operation and servicing

	<p>⚠ WARNING</p> <p>Dangerous voltages are present in the output terminals and the cables and motor terminals connected to them when the unit is switched on.</p> <p>The unit is not necessarily deenergized when the LEDs and the 7-segment display are off. Dangerous voltages may also be present when the unit is inhibited and the motor at a standstill.</p> <p>High voltages are also present in the terminals and within the drive for up to 10 minutes after the electrical supply has been disconnected.</p> <p>Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"> • Disconnect and isolate the MOVITRAC® LTE-B from the electrical supply at least 10 minutes before commencing any work on it.
	<p>⚠ WARNING</p> <p>Safety functions inside the unit or a mechanical blockage may cause the motor to stop. The removal of the source of the malfunction or a reset can result in an automatic restart of the drive.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Disconnect the unit from the supply system before correcting the fault.

3 Parameter Module

Type	Part number
LTBP-B	1821 8199



11932AXX

- Functionality
 - Storing data from the inverter in the parameter module
 - Loading data back from the parameter module into the inverter
 - Providing an infrared interface for communication between Windows PDA / Smartphone and MOVITRAC® LTE-B.
- Supported unit types
 - MOVITRAC® LTE-B.

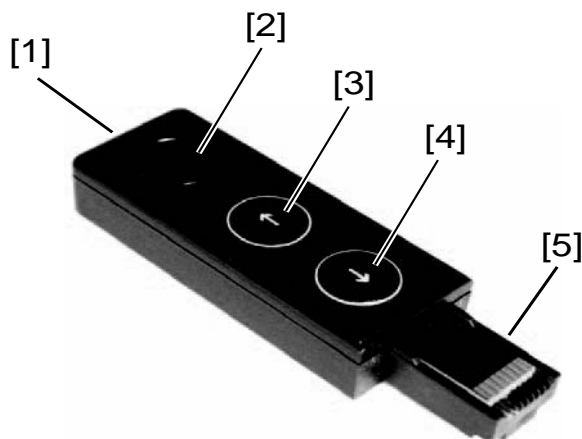


Parameter Module

Installation and Operation using a Windows PDA or Smartphone

3.1 Installation and Operation using a Windows PDA or Smartphone

- Download the appropriate LT-Shell software from the SEW-EURODRIVE Website.
- Insert the parameter module into the drive.
- Align the infra-red connectivity from the parameter module with your Windows PDA or Smartphone.
- Run the software to communicate from the MOVITRAC® LTE-B to the PDA.



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[1]	Infrared communications capability provides remote control convenience for programming with LT-shell PDA or LT-shell SP software.
[2]	Status LED <ul style="list-style-type: none"> • LED on = power on • Flashing LED = active data transfer
[3]	Copies parameters from the MOVITRAC® LTE-B to the module.
[4]	Copies parameters from the module to the MOVITRAC® LTE-B.
[5]	Insert the module into the RJ45 slot on the front of the MOVITRAC® LTE-B.

4 Remote Keypad

Type	Part number
LT BG-B	1821 8202



60201AXX

The remote keypad is designed to control the operation of the MOVITRAC® LTE-B units.

4.1 Safety notes

The level of integrity offered by the remote keypad / MOVITRAC® LTE-B control functions, for example stop / start, forward / reverse and maximum speed, is not sufficient for use in safety-critical applications without independent means of protection.

All applications where malfunction could cause injury or loss of life must be subject to a risk assessment and further protection provided where needed.

Within the European Union, all machinery in which this product is used must comply with Directive 98/37/EC, Safety of Machinery. In particular, the electrical equipment should comply with EN 60204-1.

4.2 Scope of delivery

- Remote keypad
- Self-adhesive seal
- 3 m long cable (to be plugged into the RJ45 connector on the MOVITRAC® LTE-B unit)

The maximum cable length between the keypad and the drive is 25 m for unshielded cable and 100 m for shielded cable.

4.3 Conformity

- CE-marked for Low Voltage Directive
- EN 61000-4 EMC Generic Emissions Standard, Industrial Level
- EN 61000-2 EMC Generic Immunity Standard, Industrial Level
- Enclosure ingress protection, EN 60529, NEMA 250
- Flammability rating according to UL 94



4.4 Electromagnetic compatibility (EMC)

MOVITRAC® LTE-B is designed to high standards of EMC. EMC data is provided in a separate EMC Data Sheet, available on request. Under extreme conditions, the product might cause or suffer disturbance due to electromagnetic interaction with other equipment. It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 2004/108/EC, Electromagnetic Compatibility. When installed as recommended in this document, the radiated emissions levels of all MOVITRAC® LTE-B units are less than those defined in the Generic radiated emissions standard EN 61000-6-4. The conducted emission levels are less than those defined in the Generic radiated emissions standard EN 61000-6-4 (class A) for the specified motor cable lengths.

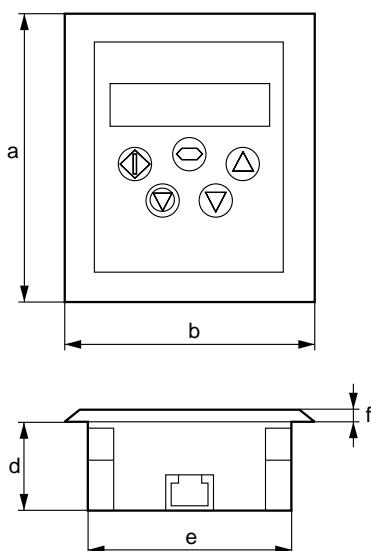
4.5 Mechanical installation

	<p>⚠ WARNING</p>
	<p>Danger of electrical shock. High voltages are present in the terminals and in within the drive for up to 10 minutes after the electrical supply has been disconnected.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Disconnect and isolate the MOVITRAC® LTE-B from the electrical supply at least 10 minutes before commencing any work on it or installing the remote keypad.

- Carefully inspect the remote keypad prior to installation to ensure it is undamaged.
- Store the remote keypad in its box until required. Storage should be clean and dry and within the ambient temperature range -40 °C to $+60\text{ °C}$.
- Install the remote keypad on a flat, vertical, flame-resistant, vibration-free surface. This should be according to EN 60529 if specific Ingress Protection ratings are required.
- Do not place flammable material close to the remote keypad.
- The entry of conductive or flammable foreign bodies should be prevented.
- The maximum operational ambient temperature is 50 °C and the minimum is 0 °C .
- Relative humidity must be less than 95 % (non-condensing).

4.5.1 Installation in switch cabinet or control panel

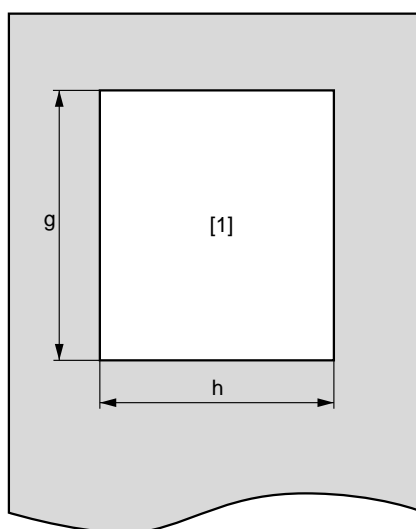
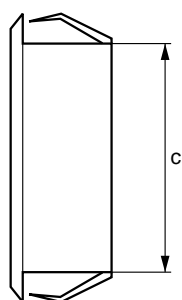
To install the remote keypad in the door of a switch cabinet or in a control panel the metal work has to be cut according to the drawing below. By using the included self-adhesive seal the installed keypad meets the IP54 / NEMA 13 standard.



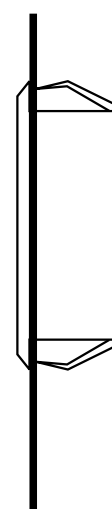
Dimension Drawing

60245AXX

- [a] 81 mm
- [b] 55 mm
- [c] 65 mm
- [d] 21 mm
- [e] 55 mm



Switch cabinet mounting cut out



60246AXX

- [f] 3 mm
- [g] 70 mm
- [h] 55 mm
- [1] Cut out

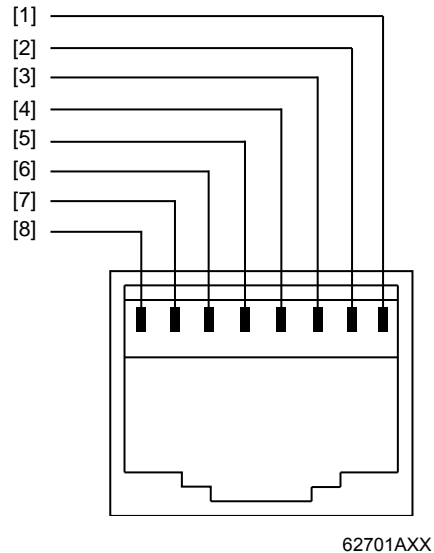


4.6 Electrical installation

4.6.1 Electrical interface

The remote keypad uses a standard RJ45 8-way connector as its electrical interface, which provides a simple solution for the user to set their system up using a standard RJ45 8-way data cable.

The signal layout of the connector is as follows:



- [1] Not connected
- [2] Not connected
- [3] +24 V
- [4] RS-485+ / internal bus¹⁾
- [5] RS-485- / internal bus¹⁾
- [6] 0 V
- [7] SBus+²⁾
- [8] SBus-²⁾

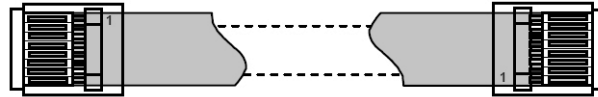
1) The bit format is fixed as: 1 start bit, 8 data bits, 1 stop bit, no parity

2) P-12 must be set to 3 or 4 for SBus communication

4.6.2 Cable requirements

Standard 8-way data cables with plugs are available from SEW-EURODRIVE on request → page 19.

If you are fabricating the cables yourself, ensure that the connection pin out is 1 to 1.



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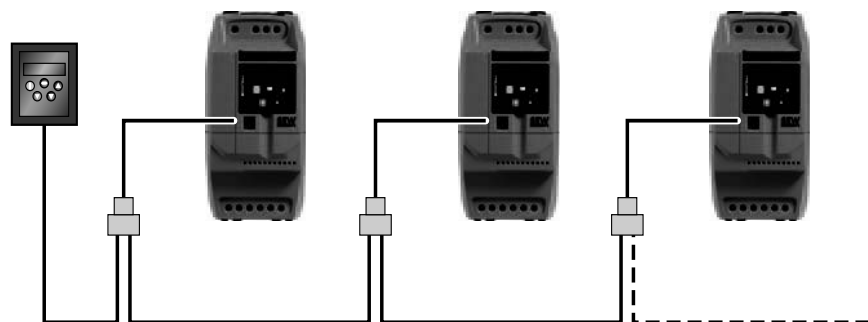
STOP!

Incorrect cable connection may damage the drive. Extra care should be taken when using 3rd party cable.

4.7 System setup

The MOVITRAC® LTE-B provides the +24V power supply to the remote keypad via RJ45 connection. Once the physical connection has been set up, the system is ready to operate.

One keypad can be used with one drive or it can be installed in a drive network (see graphic below). The keypad can then monitor and control parameters on one of the drives. The overall cable length in the network must not exceed 25 m for unshielded cable or 100 m for shielded cable.

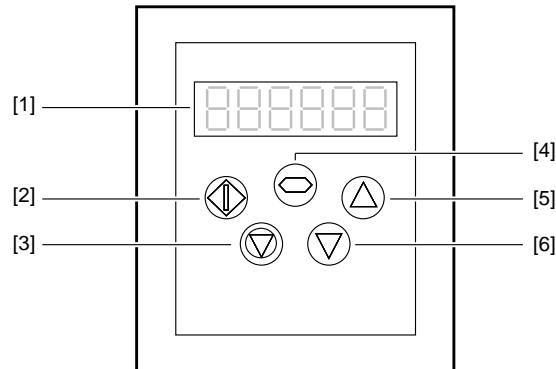


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4.8 User interface

The remote keypad user interface allows drive operation and setup without any additional equipment.



63393AXX

- | | |
|------------------|--------------|
| [1] Display | [4] Navigate |
| [2] Start | [5] Up |
| [3] Stop / Reset | [6] Down |

The keypad consists of 5 buttons with the following functions:

Start / Run	<ul style="list-style-type: none"> Enables running of motor Reverses direction of rotation if bi-directional keypad mode is enabled.
Stop / Reset	<ul style="list-style-type: none"> Stops motor Resets a tripped drive
Navigate	<ul style="list-style-type: none"> Displays real-time information Press and hold to enter / exit parameter edit mode Stores parameter changes
Up	<ul style="list-style-type: none"> Increases speed in real-time mode increases parameter values in parameter edit mode
Down	<ul style="list-style-type: none"> Decreases speed in real-time mode Decreases parameter values in parameter edit mode

The Start / Stop buttons on the keypad are disabled when the parameters have their factory default settings. To enable the operation of the Start / Stop buttons on the keypad, set P-12 to 1 or 2 (see Operating Instructions "MOVITRAC® LTE-B").

The Navigate button alone is used to gain access to the parameter edit menu. Pressing and holding this button (>1 sec) allows the user to toggle between the parameter edit menu and the real time display (where the drive operating status / running speed is displayed). By pressing this button (<1 sec) the user is able to toggle between the operating speed and operating current during drive operation.

4.9 Real-time operation

Once the communication has been set up between the drive and the remote keypad, the user can control the MOVITRAC® LTE-B by using the control buttons on the front panel of the remote keypad.

4.9.1 Display messages

The remote keypad uses various display messages to indicate different working states:

Display message	Explanation
SCAN..	The remote keypad is searching for the drive in the network.
LOAD..	The remote keypad has found the drive in the network and is loading the startup information from the drive.
Err-SC	The remote keypad has lost the communication link to the drive (see page 18).
Adr-XX	Indicates the remote keypad address, where XX = 1 ... 63.

4.9.2 Monitor / change parameter value

To monitor or change a parameter value:

- Press and hold the NAVIGATE button for more than 1s when the drive is displaying "StoP". The display changes to P-01, indicating parameter 01 in parameter group 1.
- Press and release the NAVIGATE button to display the value of this parameter.
- Change to the required value using the UP and DOWN buttons.
- Press and release the NAVIGATE button once more to store the change. Press and hold the NAVIGATE button for more than 1s to return to real-time mode.

The display shows "StoP" if the drive is stopped or the real-time information (e.g. speed, current or power) if the drive is running.



4.10 Easy startup

4.10.1 Communication address setup

By default, the remote keypad will try to communicate with the drive in address 1 in the network after powering up for the first time.

The remote keypad will display "SCAN.." after power up, which indicates that it is searching the drive with the correct drive address in the network. Once the drive has been found, the message "Load.." will be displayed. This indicates that the remote keypad is reading the configuration information from the drive. This process usually takes 1 to 2 seconds. After the data has been loaded, the remote keypad will display the drive real time status. If the remote keypad cannot find the drive in the network, i.e. there is only one drive in the network and its address is not equal to 1, the remote keypad communication address will be displayed on the monitor window as "Adr-01". The user can then adjust the address from 1 ... 63 by using the up or down buttons on the remote keypad.

Once the address has been changed to a value to match that of the drive, the stop button must be pressed to enable the remote keypad to search for the drive again. Once the communication between the remote keypad and the drive has been set up, the user can change the remote keypad address to set up communication with another drive in the same drive network at anytime.

Pressing the STOP and DOWN buttons together results in the message "Adr-XX", where "XX" represents the present address. Using the UP or DOWN button to select the desired drive address. After selecting the new address, pressing the STOP and DOWN buttons together will result in the remote keypad establishing communications with the drive which has this address.

4.10.2 Preset target speed in remote keypad mode

- To enable drive control via the remote keypad, set P-12 to 1 or 2.
- To enable the drive to start from the preset speed, ensure that P-31 = 1 or 3.
- Whilst the drive is stopped, press the STOP button. The value of the digital potentiometer will be displayed, indicating target speed.
- To select the required target speed, use the UP and DOWN buttons.
- To return to the real time display showing "StoP", press the STOP button.
- To start the drive ramping up to the target speed, press the START button.

4.10.3 Vary speed in real-time remote keypad mode

- Press the START button. The drive will ramp up to the preset speed set in the digital potentiometer (assuming P-31 = 1).
- To increase speed, press the UP button. The drive will run forward, increasing speed until the UP button is released. The maximum speed is the speed set in P-01.
- To decrease speed, press the DOWN button. The drive will decrease speed until the STOP button is released. The minimum speed is the speed set in P-02.
- To stop the drive (assuming P-31 = 1), press the STOP button. The drive will decelerate to stop at the selected deceleration ramp.
- The display will finally show "StoP", at which point the drive is disabled.
- Pressing the START button again results in the drive running back up to the speed at which it was previously running (digital potentiometer value). This only occurs if P-31 = 1.

4.10.4 Reverse direction of rotation with P-12 = 2

- Press the START button. The drive ramps up to the preset speed as set in the digital potentiometer (assuming P-31 = 1).
- To increase or decrease the speed, use the UP and DOWN buttons.
- To reverse the direction of rotation, press the START button again.
- Press the STOP button to decelerate the motor to standstill.
- Whenever the drive is started, it will start with a positive speed unless the direction is negated by the digital inputs on the user terminals



STOP!

Please refer to the MOVITRAC® LTE-B Operating Instructions for detailed parameter listing and functional setup.

The hardware enable on the drive must be present when using keypad control mode.

4.10.5 Lock / unlock parameter access

Lock parameter access

To prevent unauthorized access to the parameters, set P-38 to 1. This can be carried out on the drive or via the remote keypad. Once this parameter has been set, access to the parameters via the remote keypad will be prevented.

The operational information (speed, current, power etc.) can be still accessed as normal and the drive can still be controlled from the keypad.

Unlock parameter access

To unlock the parameter access, change P-38 back to 0. This can only be carried out on the drive itself.



4.11 Service and fault codes

4.11.1 Troubleshooting

Symptom	Cause and Solution
'Adr-XX' displayed after 'SCAN..' message	<ul style="list-style-type: none"> The remote keypad failed to find the drive with the specified address in the network. Check that the RJ45 data cable connection is correct. Check that the drive with address XX is available in the whole network. If XX >1 and only one remote keypad is connected, then ensure that the device number is 1.
Display 'Err-SC'	<ul style="list-style-type: none"> Check the electrical connection, and ensure the cable is connected correctly between the remote keypad and the drive. Press STOP button to enable the remote keypad to search the drive again. More than 1 remote keypad is being used in a drive network. Only 1 remote keypad can be used in each network. Remove the other keypads.

4.11.2 Fault codes

Trip message	Explanation
"O-I"	Over-current on drive output to motor. <ul style="list-style-type: none"> Trip on drive enable: check for wiring error or short circuit. Trip on motor starting: check for stalled or jammed motor. Trip during operation: check for sudden overload or malfunction.
"I.t-trP"	Drive overload trip, occurring when the drive has been delivering >100 % rated current (set in P1-08) for a period of time. The display flashes to indicate an overload condition.
"O-Uolt"	Over-voltage on DC bus. Check supply voltage is within limits. If trip occurs on deceleration, reduce deceleration time.
"U-Uolt"	Under-voltage trip. Happens routinely when drive powered down. If it occurs whilst running, check supply voltage.
"O-t"	Over-temperature trip. Check drive cooling and possible enclosure dimensions.
"U-t"	Under temperature trip.
"OI-b"	Brake channel overcurrent.
"OL-br"	Brake resistor overload.
"PS-trP"	Trip on drive enable: check for wiring error or short circuit. Trip during operation: check for sudden overload or over-temperature.
"E-triP"	External trip (connected to digital input 3).
"th-Flt"	Faulty thermistor on heatsink. Contact SEW-EURODRIVE Service.
"EE-F"	EEPROM fault. Parameters not saved, defaults reloaded. If fault reoccurs contact SEW-EURODRIVE Service.
"SC-trP"	Loss of communications trip.
"P-LOSS"	Input phase loss trip.
"SPIN-F"	Spin start failed.
"data-F"	Internal memory fault. Parameters not saved, defaults reloaded.
"4 ... 20 F"	Current analog input out of range. Check input current is within range defined in P-16.

5 Prefabricated Cables

5.1 Prefabricated cables with RJ45 connectors on both ends

The prefabricated cables are available in 3 different lengths. Each cable is equipped with an 8-pin RJ45 connector on each end.



11949AXX

Cable length	Type	Part number
0.3 m unshielded	LT K-RJ-003-B	1821 8210
1.0 m unshielded	LT K-RJ-010-B	1821 8229
3.0 m unshielded	LT K-RJ-030-B	1821 8237

5.2 Prefabricated cables with RJ45 connector on one end

Each cable is equipped with an 8-pin RJ45 connector on one end. These cables are used to connect MOVITRAC® LTE-B to the SEW-Gateway DFx.

Cable length	Type	Part number
0.5 m unshielded	LT K-RJ0E-005-B	1821 8245



Cable Splitter: 1 in and 2 out

Prefabricated cables with RJ45 connector on one end

6 Cable Splitter: 1 in and 2 out

Type	Part number
LT-RJ-CS-21-B	1821 8253

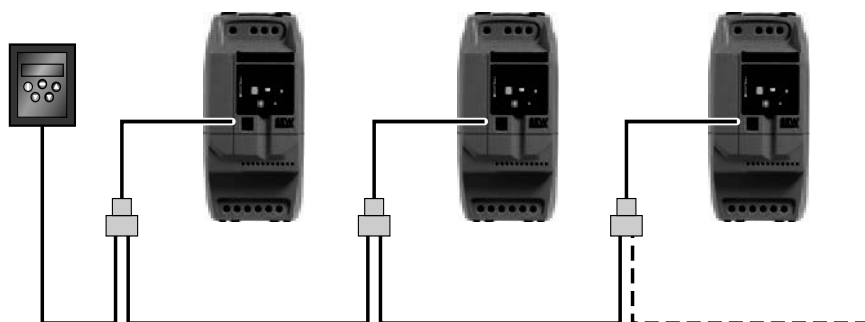


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The RJ45 data cable splitter is required when the RJ45 communications port from a MOVITRAC® LTE-B unit is connected to >1 other drive.

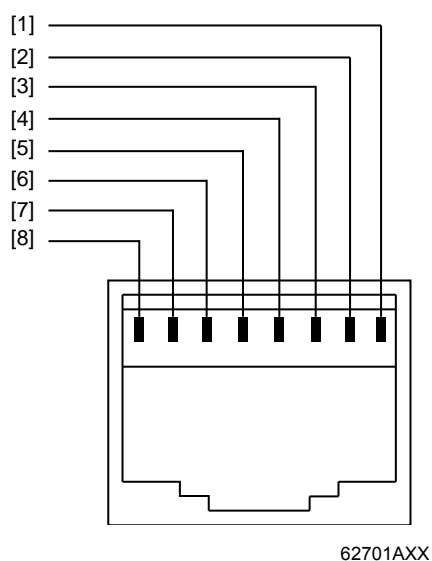
Typical applications are where communication is required from any of the following sources to multiple drives forming a network:

- Remote keypad LT BG-B
- Drive networks to MOVI-PLC® via SBus
- Fieldbus communication via UOH / DFX gateway



63282AXX

6.1 Communication interface



- | | |
|-----|--------------------------------------|
| [1] | No connection |
| [2] | No connection |
| [3] | +24 V |
| [4] | RS-485+ / internal bus ¹⁾ |
| [5] | RS-485- / internal bus ¹⁾ |
| [6] | 0 V |
| [7] | SBus+ ²⁾ |
| [8] | SBus- ²⁾ |

1) The bit format is fixed as: 1 start bit, 8 data bits, 1 stop bit, no parity

2) P-12 must be set to 3 or 4 for SBus communication



7 SBus Terminating Connector

Type	Part number
LT-CS-TR-B	1821 8261



63456AXX

The SBus terminating connector is required if MOVITRAC[®] LTE-B is used in conjunction with MOVI-PLC[®] or the SEW Gateway DFx. In this case the last MOVITRAC[®] LTE-B in the network must be connected via this terminating connector.

8 Fieldbus Connection

8.1 Fieldbus gateways

The fieldbus gateways convert standard fieldbuses into the SEW SBus. This means that up to 8 inverters can be triggered using one gateway.

The controller (PLC or PC) and the MOVITRAC® LTE-B frequency inverter exchange process data, such as a control word or speed, using the fieldbus.

In general, you can also connect and operate other SEW-EURODRIVE units, such as MOVIDRIVE® inverters, using the SBus.

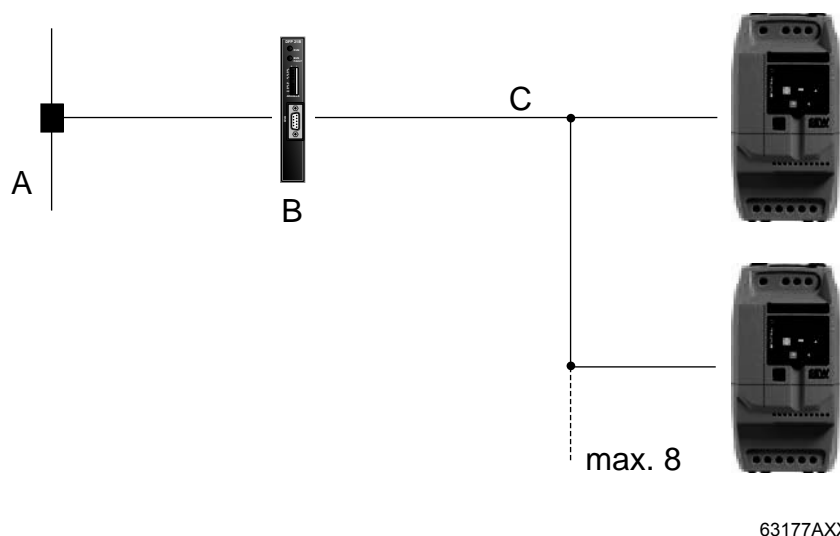
Available gateways

Gateways are available for the following bus systems for connection to fieldbuses:

Bus	Separate housing
PROFIBUS	DFP21B / UOH11B
EtherCAT	DFE24 / UOH11B
DeviceNet	DFD11 / UOH11B
PROFINET	DFE32 / UOH11B
INTERBUS	UF111A (823 898 7)

Operating principle

The fieldbus gateways have standardized interfaces. Connect lower-level MOVITRAC® LTE-B units to the fieldbus gateway via the SBus unit system bus.





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